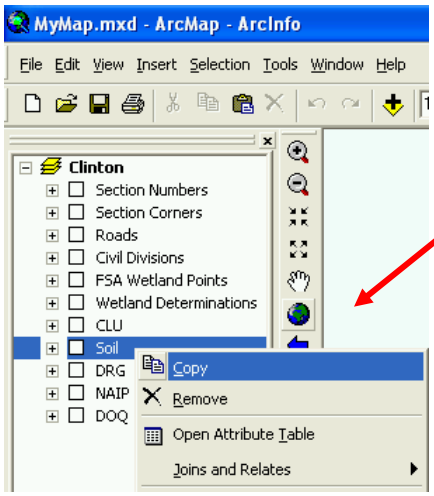
Displaying a Subset of Features

There are many occasions when you may want to display only certain features within an ArcMap layer. This skill builder outlines two of the most common methods for limiting feature display without actually altering the data.

Keep in mind each ArcMap layer is really just a set of rules for displaying a specific dataset. One of the most basic, but certainly powerful, capabilities is that users can specify layer display rules based on the attributes of the features being displayed. In effect, users can set a "filter" to control which features are displayed.

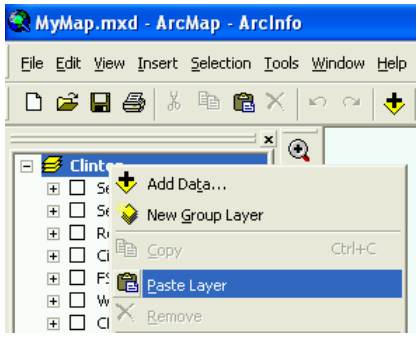
Filtering By Symbology

In this example, we will create a new layer which displays a limited subset of soil map units.

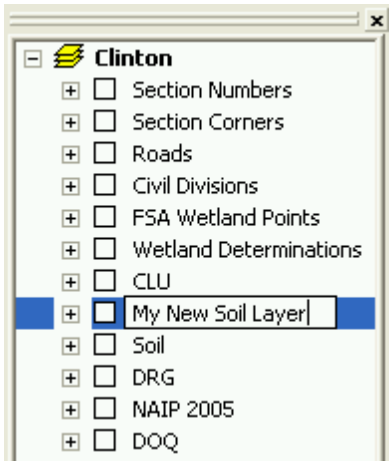


First, we'll make a copy of the county soils layer which we can then modify without affecting the original layer…

1. Right-click on the Soil layer and choose **Copy**



2. Right-click on the Data Frame and choose **Paste Layer**



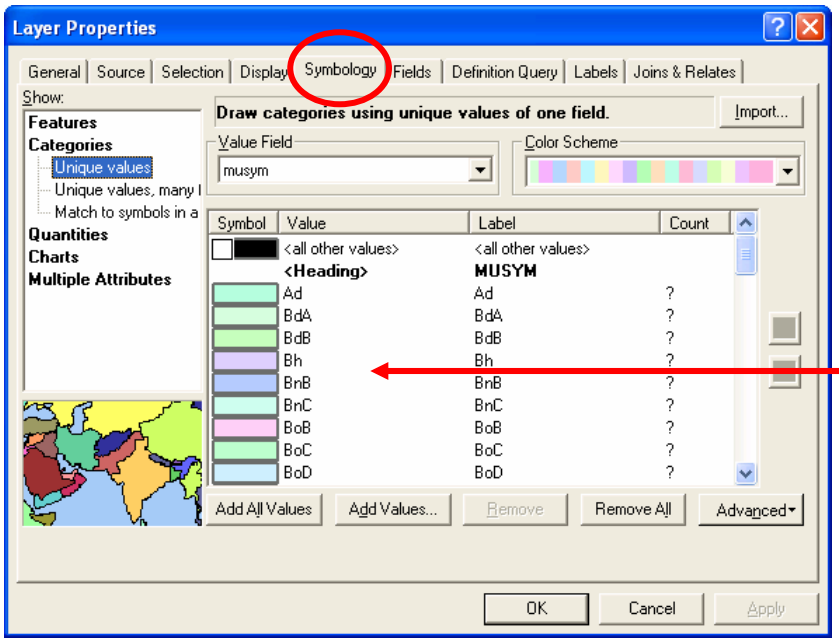
3. Drag and drop the new layer into the desired position within the Table of Contents (TOC)

4. Rename the new layer in order to avoid confusing it with the original layer.

Filtering By Symbology (continued)

Next, we will alter our new layer's symbology…

1. Right-click on the layer and choose **Properties**



2. In the Layer Properties window, click the **Symbology** tab.

   As we can see, the symbology is set at "Unique Values" based on the "musym" attribute.

   The individual symbols for every possible value of "musym" are listed in separate legend categories.

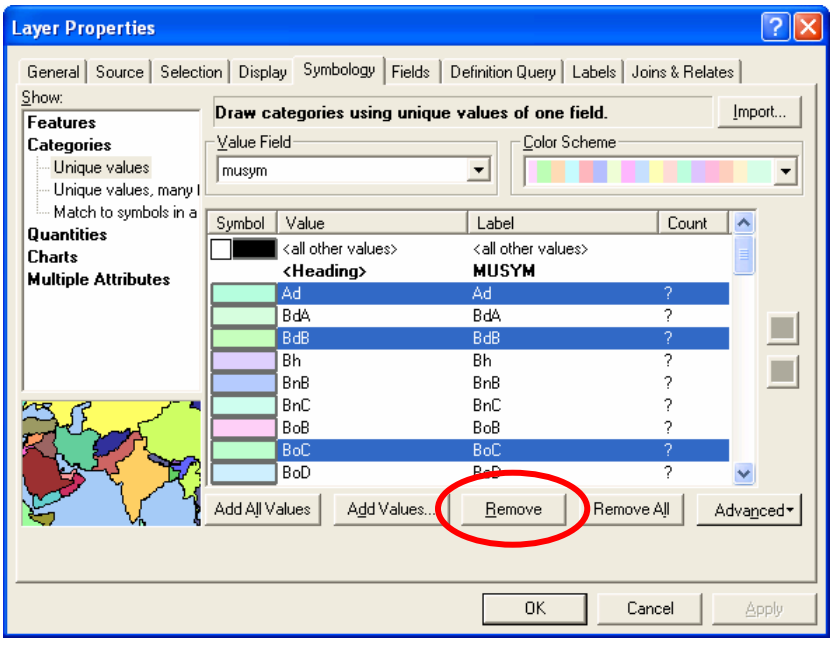
   Our next step will depend largely on how few or how many map units we wish to eliminate from the display…

3. To retain most of the map units and eliminate only a few, select the ones you don't want in the category list and click the **Remove** button.

   You may select multiple categories by holding down the <Shift> or <Ctrl> key as you click.

   In this example, the symbology rules for map units "Ad", "BdB", and "BoC" would be removed.

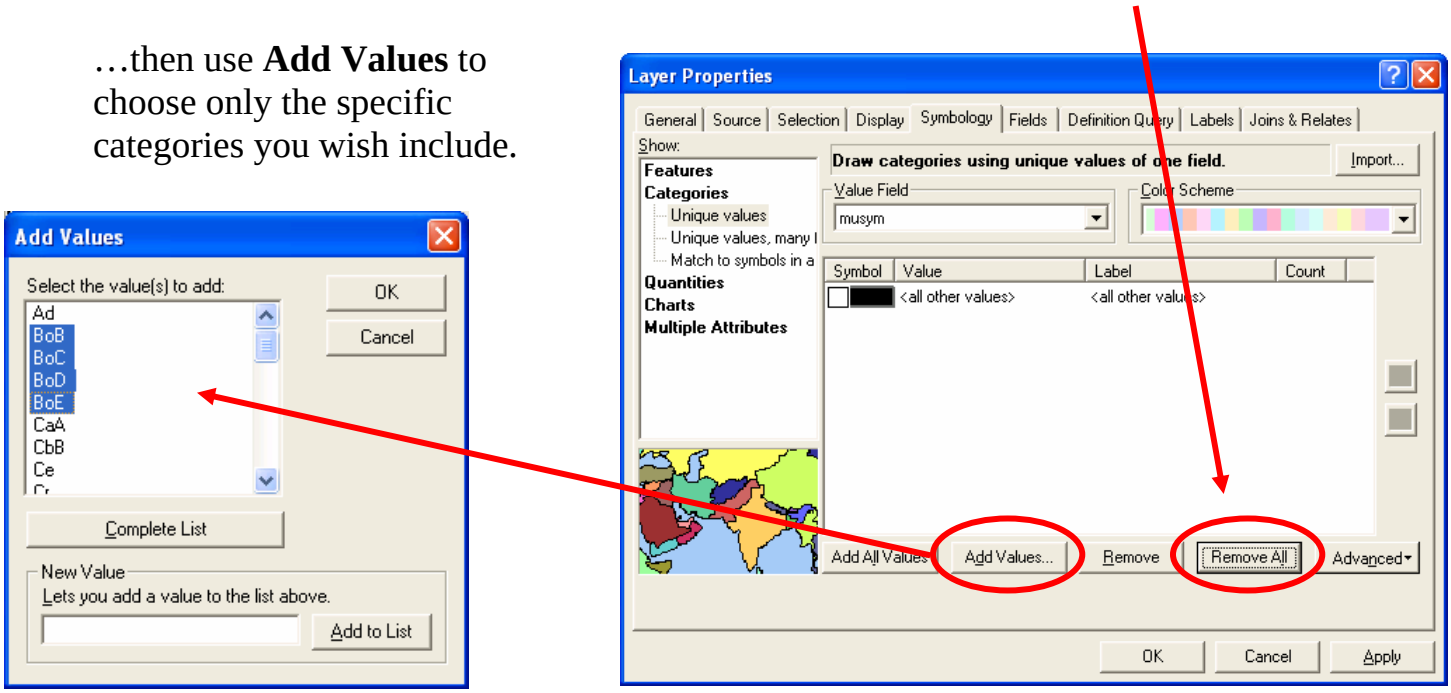
   Therefore, any features with an "musym" attribute of "Ad", "BdB", or "BoC" would no longer display.



Filtering By Symbology (continued)

4. Or if you would rather retain only a few of the map units, click **Remove All**…

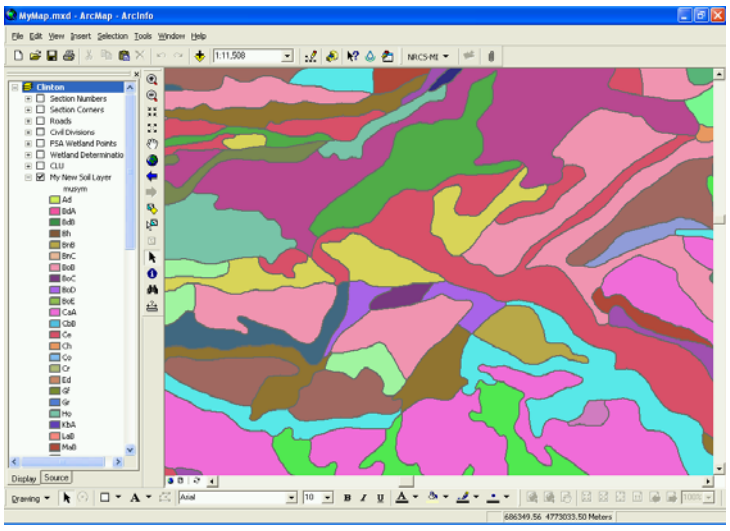
   …then use **Add Values** to choose only the specific categories you wish include.



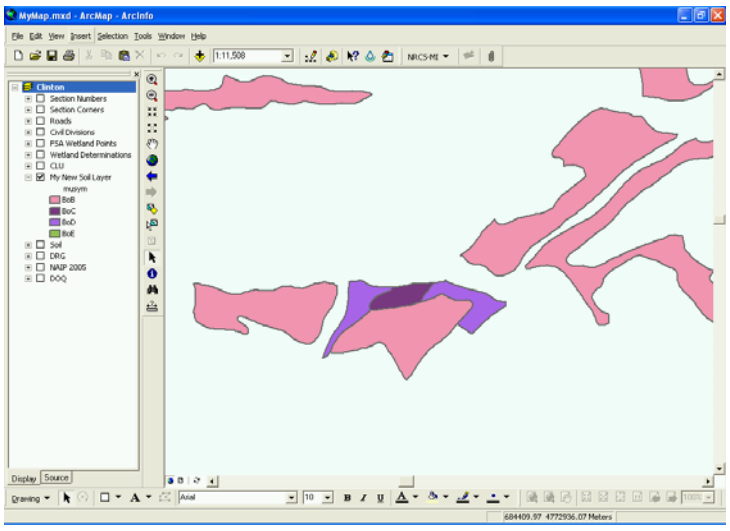
5. After choosing the categories to display, set each category's symbology as desired, and click **OK** to continue.

Based on step #4 above, our new layer would only display the soil features "BoB", "BoC", "BoD", and "BoE".

BEFORE



AFTER



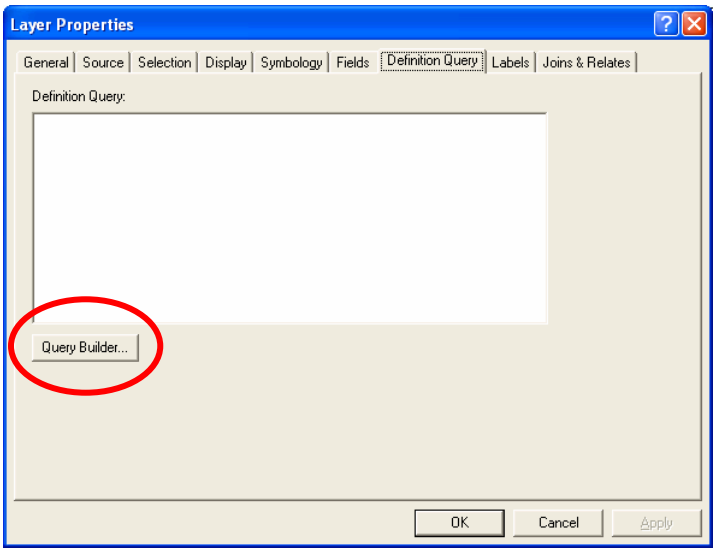
Remember, all of the other map unit features still exist – we've just altered the rules by which the data displays. Since we haven't provided display rules for the other map units, they simply don't display.

Definition Queries

Another method for displaying only a subset of the data is to set up a definition query. A definition query acts as a dynamic filter based on feature attributes, allowing a user to restrict display to features with specific attribute values.

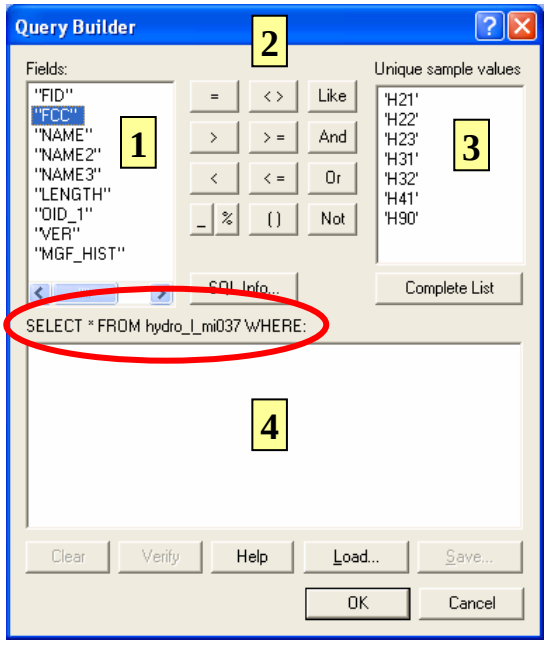
Sound confusing? It's not, really. For example, the county "hydro_l" shapefiles contain features for rivers, drains, and lakes. But what if we only want to display the river features? The easiest method is to set up a definition query…

1. Right-click on the county "hydro_l" layer and choose **Properties**



2. In the Layer Properties window, click the **Definition Query** tab.

3. Click **Query Builder…**



The main parts of the Query Builder window are…

1. The dataset's attribute fields
2. Operation functions
3. Available values in the selected attribute field
4. The query statement window

Queries are built in that same order …

1. Select an attribute field
2. Select an operator
3. Select an attribute value
4. The query string appears in the statement window

Queries are actually fairly simple as long as you keep in mind that you are entering the information necessary to complete the "SELECT" statement. For example, entering **"FCC" = 'H31'** in the statement window is saying, in this case, "Select every feature in the hydro_l_mi037 layer whose FCC attribute is equal to H31".

Definition Queries (continued)

For this example, we will set our definition query to include all of the features with an "FCC" value beginning with an "H3". (H31, H32, etc.)

4. Build the query statement as follows…

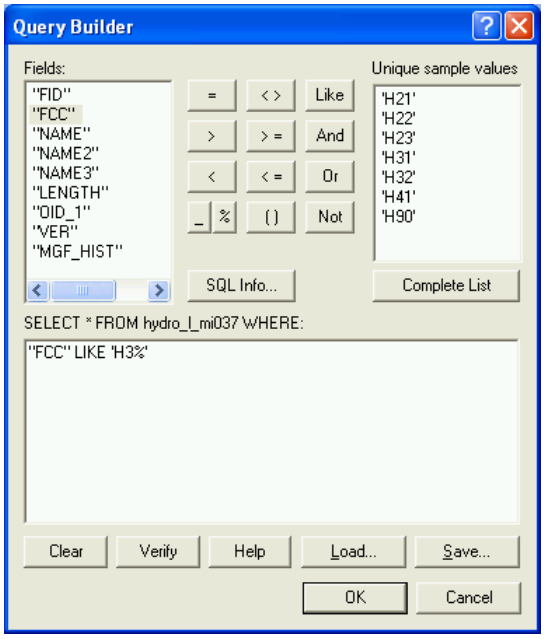
   - Double-click **FCC**

   - Click **Like**

   - Double-click **H31**

   - In the statement window, replace the "**1**" with a "**%**"

   The "%" is a wildcard, which basically just says "and any other characters".

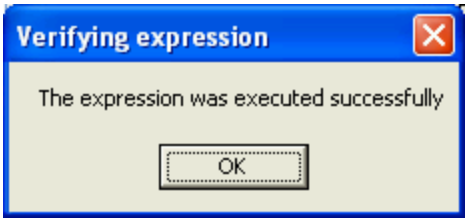


5. You'll find that the Query Builder is very touchy about syntax. You may check the validity of your query syntax with the **Verify** button.

   Here are some of the verification messages you might run into…

Your query statement doesn't follow the proper syntax rules. (Incorrectly placed quotation marks, for example.) If nothing is immediately obvious, erase your query string from the statement window and re-enter it.

Your syntax is fine, but no features were found which match the criteria you entered. If we received this message in this example, it would mean that none of the features had an "FCC" value beginning with "H3".



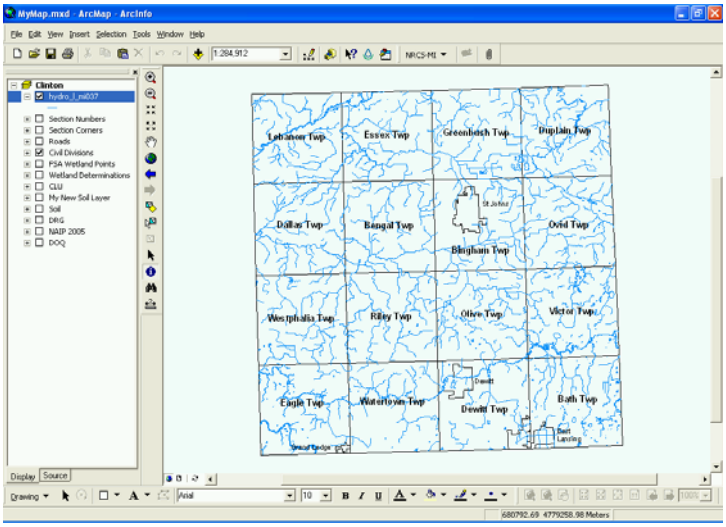
The syntax is fine and at least one matching feature was found.

6. When satisfied with your query statement, click **OK,** and **OK** again to apply the definition query.

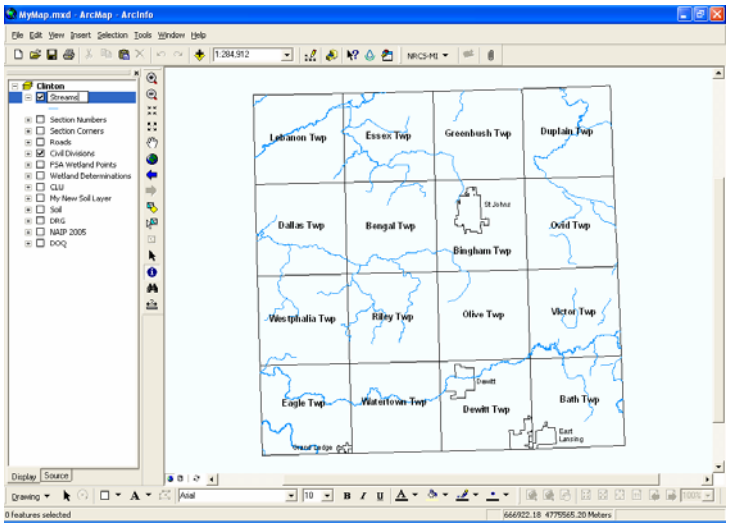
Definition Queries (continued)

The definition query we set up for this layer now filters out features which do not have an "FCC" value beginning with "H3".

BEFORE



AFTER



As with filtering by symbology, it is recommended that you consider renaming your layer after setting up a definition query, just to avoid confusion with the original layer.

Definition Queries for Michigan Framework Data

The State of Michigan Center for Geographic Information (CGI) recently released version 6b of their geographic Framework datasets. Some of the individual datasets which were available in previous versions have been combined into "master" datasets in version 6b.

Users who wish to mimic the previously available data layers may construct definition queries using the following information…

INPUT DATA	OUTPUT LAYER	QUERY STRING
hydro_l_mi[FIPS]	River lines	FCC LIKE 'H3%'
hydro_l_mi[FIPS]	Drain lines	FCC LIKE 'H4%'
hydro_l_mi[FIPS]	Lake outlines	FCC LIKE 'H2%' OR FCC LIKE 'H90' OR FCC LIKE 'H51'
hydro_l_mi[FIPS]	Great Lakes shoreline	FCC LIKE 'H1%'
hydro_a_mi[FIPS]	River polygons	TYPE = 'river'
hydro_a_mi[FIPS]	Lake polygons	TYPE = 'lake'
allroads_a_ mi[FIPS]	Named road lines	NOT NAME = '' AND NOT NAME = ' '
allroads_a_ mi[FIPS]	Unnamed road lines	NAME = '' OR NAME = ' '

Framework v6b metadata (including attribute values) is located in "f:\geodata\local_metadata".